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ABSTRACT

Four major issues are explored in this study of child development research and its implications for children's playgrounds: (1) theories and philosophies of play; (2) the historical evolution of playgrounds; (3) research on child development, play, and playgrounds; and (4) creating playgrounds that meet children's developmental needs. Discussion of the first issue surveys early views of play, including the outdoor gymnasiums of the late 1800's; more recent views based on emotional, cognitive, social, and perceptual-motor theory and research; processes of play; and developmental benefits of play. Discussion of the second issue describes traditional, creative, and (extensively) European adventure playgrounds, and points out that the adventure playground is consistent with the philosophies of many noted philosopher-educators, including Dewey and Piaget, and has a record of success in Europe. Exploration of the third and fourth issues begins by pointing out that a striking contrast exists between developmentally appropriate playgrounds and typical American elementary school playgrounds. Research suggests that developmentally appropriate play environments should include materials, equipment, space, and activities to enhance all forms of play, and contain complex superstructures and simple moveable materials to be used in combination. Additionally, to counter conditions of modern, urban, technological society, play environments should include nature areas and provide tools children can use to care for the total play environment. (RH)

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CHILD DEVELOPMENT AND PLAYGROUNDS*

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In order to understand and use the rapidly accumulating body of information about child development and its implications for children's playgrounds, one must place the relevant issues in historical perspective. Four major issues will be explored in this paper: (1) theories and philosophies of play, (2) historical evolution of playgrounds, (3) research on child development, play and playgrounds, and (4) creating playgrounds that meet children's developmental needs.

Historically, play was regarded as wasteful, sinful and frivilous and childhood was characterized by sexual abuse, infanticide, harsh discipline and hard labor. Fortunately for children, a few philosophers and poets have been articulate in expressing their views of play. Plato and Aristotle agreed that children should engage in play and that play was a primary influence in the education of the young. During the 1600's-early 1900's, Comenius, Locke, Luther, Basedow, Rousseau, Pestalozzi, Froebel, Dewey, Montessori and Gesell argued that play was important in the development of children and proposed its integration into educational programs. The views of these romanticists conflicted with the beliefs of the general populace of their respective periods and set them apart as liberal or radical.

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Older Views of Play

With the onset of the scientific era, scholars began to complement the views of philosophers with the conclusions of "organized logic." The surplus energy theory, commonly expressed by educators as "the need to expend excess energy," can be traced to Aristotle, the poet Schiller in 1800, to Herbert Spencer's writing in 1875, and to Karl Groos (1898). In rapid succession the instinct-practice theory (Groos, 1898), the recapitulation theory (Gulick, 1920; Hall, 1906) and the relaxation theory (Patrick, 1916) were formulated. These theories implied narrow, insipid roles for children's play. The implications of these theories for playgrounds would focus upon space for motor activities-space for running off excess energy (surplus energy), practicing or repeating motor skills (instinct-practice), sand and water for digging, crawling and climbing (recapitulation), and space for running, throwing and climbing (relaxation).

Given this body of theory, it is little wonder that the earliest playgrounds were of such sterile design. The first playground for young children, established in Boston in 1886, consisted essentially of heaps of sand, patterned after the sandgardens of Berlin (Sapora and Mitchell, 1948). Consistent with early theory emphasing motor movement and excess energy, the earliest park playgrounds were called outdoor gymnasiums. They were equipped with exercise apparatus, tracks and space for games. Later, schoolyard playgrounds followed this same pattern.

The 1928 National Recreation Association Guidelines (Butler, 1958) proposed that preschool playgrounds contain a sand box, six chair swings, a small slide and a simple low climber. The elementary school playground should contain a horizontal ladders, a balance beam, a giant stride, six swings on a frame twelve feet high, a slide eight feet high with a chute sixteen feet

long, a horizontal bar and optional equipment such as traveling rings, see-saws and low climbing devices. Equipment was to be made of galvanzied steel, swing seats of hardwood, slides narrow enough to ensure one at a time sliding with an eight inch platform at the top. The design and materials should ensure economical maintenance, simplicity of supervision, safety and recreational value.

These guidelines, consistent with the theories of the times, established patterns of playground design that continue to exert profound influence on today's playgrounds. All of the equipment described is still available from some of today's manufacturers! The general playground description could just as accurately be applied to most public schools today as it was sixty years ago! It is as though many manufacturers and consumers were in a time-warp, oblivious to the research and development of the past half century.

It is to be credit of early playground developers that the first guidelines for surfacing, developed by the National Recreation Association (1932) in 1932, recommended special resilent surfacing such as tanbark, sawdust, shavings or sand under climbing, rotating and sliding equipment. Unfortunately, this recommendation, though reiterated in publications on playground safety over the past fifty years, has yet to be extensively implemented.

Fortunately, contemporary theories of play have the advantage of reflecting a growing body of scientific evidence. They expand the emphasis of early theories on exercise or motor activities to a broad complex of developmental benefits of play, namely, cognitive, social, emotional and perceptual-motor. As expected the more recent theories do focus upon the biases and expertise of their developers, but taken collectively the entire range of human development is considered (see Frost, 1985).

Recent Views of Play: Emotional Cognitive, Social and Perceptual-Motor Bases

The psychoanalytic theory of play has roots in earlier cathartic theory which held that play was an activity for pursuing painful or pleasant feelings and emotions. This emphasis upon emotions and emotional development in play originated with Freud in the early 1900's and was elaborated by Walder (1933) and Erikson (1950). Freud (1959) believed that play revealed the inner life and motivation of the child and that play was a vehicle for reenacting unpleasant experiences and thus, to master them. In so doing, the child develops control over his/her emotions and the need to play is reduced as he/she grows older.

Erikson added cognitive dimensions to Freud's emotional constructs, explaining the developmental progression of play and resulting cognitive and emotional development from infancy to adulthood. Similar to Piaget, he proposed an infancy period of exploratory play centered upon the infants body, accompanied by vocalizations (language development) and kinesthetic sensations. Through such play, the child develops new skills, leading to a second stage of learning to manage toys and objects and, finally, to a third stage where the child shares play with others.

These points of view about the child's development through play call for an expansion of the traditional playground to include a wider range of opportunities, places, and materials. The child needs semi-private places-harbors for overhauling (playing out) shattered emotions; places for social play and learning and for interacting and cooperating with others; a wide range of moveable materials (loose parts) for creating model situations, mastering emotions and constructing reality by experiment and planning.

Erikson's view that the child achieves emotional, social and intellectual mastery through play are also basic elements in Piaget's cognitive-developmental theory. Piaget (1962) linked the developmental progression of play to his stages of cognitive development. Contrary to popular opinion, his descriptions of the progression of games (play) are not totally original, but draw from the earlier work of Charlotte Buhler (1935) and Karl Buhler (1937).

To Piaget, play is a vehicle for knowing, i.e., learning and cognitive development and, as such, is an indicator of the child's cognitive development. He views intelligence as the organization of adaptive behavior. Adaptation is the modification of the organism through organism-environment interchanges (which occur during play). Consequently, opportunities for the child to interact with concrete objects is seen as essential in his/her development. Adaptation occurs through the recriprocal processes of assimilation and accommodation. Assimilation is the action of the organism on objects; accommodation is the action of the environment on the organism. In play, reality (objects as symbols) is modeled or bent to the wishes of the child (<u>assimilation</u>). In imitation, the child adapts himself (cognitive structure) to reality, mimicking or <u>accommodating</u> to the actions of another person.

<u>Processes of Play</u>

The cognitive play categories initially proposed by Buhler and expanded by Piaget and numerous researchers are called several names-<u>practice</u>, <u>functional</u> or <u>exercise</u>- originating and dominant during infancy. Practice play is the repetition of actions already learned, followed by elaboration of themes in the presence of materials (toys) and frequently gaining language support from one or more adults. Some dimensions of the second category-<u>dramatic</u>, <u>imaginative</u>, <u>make believe</u>, <u>pretend</u> or <u>symbolic</u>-are clearly seen during infancy Dramatic play emerges full bloom at about two

years of age and involves the substitution of imaginary objects (mental imagery or symbolic behavior) for real objects, animals or people in make-believe play situations. A third category, construction or constructive is also seen evolving around age two. Children build or construct designs (bridges, houses, etc. from simple materials (loose parts) such as blocks or tinker toys. At about age five games with rules or organized games are emerging. Children begin to accept prearranged rules and adjust to them in their games shared with other children (hop skotch, jacks, football, etc.).

Parten (1932) is credited with categorizing social play. In solitary play the child plays alone and independently. In parallel play the child plays in close proximity to other children but not with them. In associative play, the child plays alternately with other children and alone but each child plays as he or she chooses. In cooperative play the child participates as a member of a self-organized play group striving to attain a common goal.

These categorizations of cognitive and social play have endured the test of many research projects (e.g., Smilanski, 1968; Rubin, Maioni and Hornung, 1976); Frost and Campbell, 1985; Henniger, 1985) and, with modifications for age groups and research contexts, remain viable systems for communicating about play. Indeed, these categories or processes of play appear to be viable across nations and cultures, that is, all normal (healthy) children engage in these play processes in a generally predictable manner. Babies in China or the United States engage in practice play; preschoolers in Africa and Australia engage in dramatic play; elementary school age children in England and Japan participate in organized games-and they do this without teaching or specific directions. Play is a natural phenomenon in human behavior. It is done by all healthy children and the patterns or processes of play are remarkably similar across geographical areas. However, it should be noted that the content (toys,

imaginary models, equipment) of play differs markedly from culture to culture. For example, the symbolic content of American children's play is predominatly television characters, and their playthings are primarily manufactured dolls, wheeled vehicles, war toys, and manufactured swing/slide/cimbing sets. Children's symbolic play in remote areas involves traditional mother/father and community member roles and their playthings are natural (rocks, sticks, water, dirt) and self-made toys (dolls, weapons, etc.).

Developmental Benefits of Play

The prevailing belief that play is a waste of time is perhaps the single most restrictive factor in providing good play environments. The contemporary elementary school playground is designed as though playground activity contributes nothing to thinking, relating and creating. A second source of this problem appears to be prevailing naivete about the benefits of play among designers, teachers, administrators, parents and politicians. A rapidly growing body of research data now provide overwhelming evidence of the multiple benefits of play for the development of children. A sample of the evidence follows.

From a therapeutic perspective, play is a means for overcoming fears (Klein, 1932; Isaacs, 1933; Axline, 1947; Erikson, 1950). Play promotes cognitive development (Sutton-Smith, 1967, 1977; Piaget, 1962; Saltz and Brodie, 1982; Fein, 1979; Saltz, 1980; Bruner, 1972; Bruner, Jolly and Sylva, 1976). Play leads to discovery, verbal judgment and reasoning and it is important in developing manipulative skills, imaginative art, discovery, reasoning and thought (Isaacs, 1933). Play with objects results in divergent production or expands uses for objects (Sutton-Smith, 1968; Goodnow, 1969;

Dansky, 1980b) and improves problem solving (Sylva, 1977; Smith and Dutton, 1979; Dansky and Silverman, 1973). Play is necessary for culture. Culture arises in the form of play (Huizinga, 1950).

Play training for children enhances imaginative play (Smilansky, 1968; Feitelson and Ross, 1973; Smith and Sydall, 1978), enhances creativity (Feitelson and Ross, 1973; Dansky, 1980a), enhances language development (Vygotsky, 1967; Lovinger, 1974; Saltz, Dixon and Johnson, 1977), and enhances group cooperation (Rosen, 1974; Smith and Sydall, 1978). Play training for teachers improves their interaction with children during play (Busse, Ree and Gutride, 1970; Wade, 1984).

It is anticipated that this growing body of evidence of the benefits of children's play and of the efficacy of educating teachers about play will lead to the introduction of new courses of study in higher education of institutions including schools of architecture education, child development and physical education. Awareness of this body of evidence should eventually lead to radical modification of thought and action in designing and using children's playgrounds.

Evolution of Playgrounds

Insofar as playground design is concerned, acceptance and understanding of the benefits of play have led some adults to develop creative places for childrens' play. Among the many types of playgrounds developed over the decades, most were hazardous and ill-suited to the developmental and learning needs of children. The traditional playground, originating around the turn of the present century, as we have seen, featured hazardous, heavy, fixed steel equipment of limited function, installed on hard surfaces and poorly maintained and supervised. This traditional playground remains the dominant type for today's elementary schools. During World War II and past war years,

theme equipment (steam engines, airplanes, mammoth insects, wild west villages, sculptured equipment (animals and abstract concrete and plastic forms) was popular during the 1950's and 1960's along with concrete pipe creations. During the 1970's modular wood equipment featuring super-structures with multiple apparatus for perceptual-motor development became popular. This was followed by the introduction in the early 1980's of modularized, powder coated steel and aluminum superstructures, also oriented to perceptual-motor development.

Playgrounds specifically designed to enhance creativity in children, are frequently called creative playgrounds. Research comparing play on creative versus traditional playgrounds shows that exercise play and organized games are significantly higher on the traditional playground and dramatic and construction play are significantly higher on the creative playground (Frost and Campbell, 1985; Campbell and frost, 1984; Strickland, 1979). On a creative playground with a variety of loose parts, the children were the characters in dramatic play; on a traditional playground where loose parts were absent, the children merely talked out roles (Strickland, 1979). Children prefer action-oriented over static equipment (Frost and Campbell, 1985; Campbell and Frost, 1985). Play and safety are enhanced by the addition of sand underneath structures (Frost and Klein, 1983), variety in play behaviors is stimulated (Powers, ,1976) and time at play and peer interaction are increased (Bruya, 1985).

Superstructure value is further enhanced by providing loose parts to use under and around the superstructure for dramatic and constructive play (Frost and Klein, 1983; Strickland, 1979). Loose parts provide for flexibilty, diversity, novelty and challenge - all important ingredients for creativity, socialization and learning. They are adaptable for use with fluid materials

(sand and water) and with larger structures (Strickland, 1979; Noren-Bjorn, 1982).

Overall, the research shows that traditional playgrounds are poor play spaces from both safety and developmental perspectives (Hole, 1966). They fail in terms of use rates when compared to alternate play spaces such as vacant lots and roads, not designed for play (Holme and Massey, 1971, and they have lower attendance rates, compared to creative playgrounds (Frost and Strickland, 1978) and when compared to adventure playgrounds (Hayward, et al 1974).

Adventure Playgrounds

In the context of this review of research on child development, play, and playgrounds, an inescapable conclusion emerges. From a purely child development perspective, that is, for enhancing the total develoment of children, the adventure playgrounds which originated in Denmark and proliferated in other European countries, are head and shoulders above most others in quality and range of opportunities for children. The jury is still out on the safety of adventure playgrounds. Undoubtedly, playleaders are a key factor in promoting safety on any playground.

It is interesting, indeed, that the best playgrounds for children did not emerge from research but originated in the creative genius and concern of a few play environment pioneers. Little did C. Th. Sorensen realize in 1943, upon establishing the first "waste material playground" (Lady Allen of Hurtwood, 1968) in Emdrup, Denmark, that his creation would usher in a new era in playgrounds. His simple aim, ". . . to give children in towns the same chance for creative play as those in the country. . ." could not have been more consistent with accepted principles of child development. Sorensen and his followers understood that children need opportunities to create for

themselves; that their play is infinitely varied, and that play opportunities must also be infinitely varied.

Sorensen's ideas for "junk" playgrounds came from his sensitive observations of children playing on construction sites with scraps of materials and the terrain itself. He understood that modern civilization hampered the play of children with hygenic, overstructured, adult inspired playgrounds, so he provded tools, materials and space and allowed children to build, change and create, for themselves.

Another primary factor in the success of adventure playgrounds was the success of the first play leader, John Bertlesen (Lambert, 1974). Abernethy ( ) described the ideal leader as a combination of mother and father, policeman, and Robin Hood. Lambert (1974), a play leader himself, said of the play leader, "He is the touchstone on which they wil return in moments of excitement and moments of crisis."

The adventure play concept has gradually expanded across much of Europe. Bengtsson (1973) credited Sorensen with the concept, Bertlesen with the philosophy and Lady Allen of Hurtwood with telling the world about it. Indeed, she was responsible for the British adventure playground movement. She established the first adventure playgrounds for handicapped children in London and, in 1966, formed the Handicapped Adventure Playground Association.

In contrast to the traditional American playground, the adventure playground allows children to create the form and structure of their own play rather than have it imposed by an unmalleable environment. The London Adventure Playground Association (Jago, 1971) describes adventure playgrounds:

> An adventure playground can best be described as a place where children are free to do many things that they cannot

> easily do elsewhere in our crowded urban society. In an adventure playground, which can be any size from one third of an acre to two and a half acres, they can build houses, dens and climbing structures with waste materials, have bonfires, cook in the open, dig holes, garden, or just play with sand, water and clay. The atmosphere is permissive and free, and this is especially attractive to children whose lives are otherwise much limited and restricted by lack of space and opportunities.
>
> Each playground has two full-time leaders in charge who are friends to the children, and help them with what they are trying to do. There is a large hut on each playground and this is well equipped with materials for painting, dressing up and acting, modeling and other forms of indoor play. There is also a record player, table tennis and so on, so that in bad weather and in winter the adventure playground hut becomes a social center for many children who would have nowhere to play except the street.

In the best adventure playgrounds of Denmark and Sweden, additional features are seen. In Stockholm the author observed a group of children assisting a sow in giving birth to pigs. Others worked in gardens with their grandparents and still others socialized in a canteen-like area featuring food, drinks and games for the children. In Copenhagen one group of children fed and brushed the horses, cleaned the stables, and later prepared the horses for riding. In another playground children constructed hutches for their rabbits and fed their chickens. And on a third children prepared outdoor fires in the area designed for that purpose and set about to cook their evening meal. All of this with the unobtrusive involvement of play leaders. Construction areas (building areas), storage bins and buildings, under-fire's areas, gardens, animal hutches, cooking areas, wading pools, sand areas, climbing structures, commons areas (organized games) and main buildings (indoor recreation) are all common features of adventure playgrounds.

The adventure playground is indeed consistent with the philosophies of many noted philosopher-educators: Dewey - children learn through experience; Piaget - children learn through actions on concrete objects; Keats - "Nothing ever becomes real until it is experienced."; Whitehead - "From the very beginning of his education the child should experience the joy of discovery."; Schiller; "As for art, so for play, freedom is entirely necessary." The defense for adventure playgrounds then, makes up in philosophy what it lacks in research.

Unfortunately for children the history of success for adventure playgrounds in Europe has had limited influence on American playgrounds. Slowness of acceptance in the United States is due to a combination of factors including objection to their untidy appearance, ignorance about the nature and importance of children's play, and unsubstantiated fears of injury and liability.

Conclusion

Given these positive views of adventure playgrounds a logical conclusion could well be - if one wishes to create developmentally appropriate play spaces for children, go out and build adventure playgrounds. Indeed, such a movement would lead to dramatic improvements over conventional American playgrounds. But the relevant conclusion is not what type of playgrounds to build or even by what name they should be called but what should playgrounds be like if they are to be developmentally appropriate for children?

There is a striking contrast between developmentally appropriate playgrounds and typical American elementary school playgrounds. The results of the National Elementary School Playground Equipment Survey show that the ten most common types of equipment are: chinning bars (16% of all equipment), swings (13%), overhead ladders (10%), flat slides (9%), fireman's

pole (9%), balana beams (8%), monkey bars (8%), see-saws (6%), parallel bars (5%), geodesic domes (3.5%). Sand play containers were 1.3% of all equipment and water play containers comprised 1%. Half of the playgrounds had hard surfaces that would accommodate wheeled vehicles but the survey did not determine whether wheeled vehicles were available. Smaller sized play equipment for younger children was present in 64% of the playgrounds.

Overall the results reveal that elementary school playgrounds are much like those of a half-century ago and they are still in general compliance with the National Recreation Association's 1928 guidelines! The typical playground contains an array of equipment designed to facilitate motor development without regard to social, emotional and cognitive development and emphasizes exercise play, with little equipment appropriate to dramatic and construction play. With respect to the issue, "Is the contemporary elementary school playground appropriate to the developmental needs of children?" one can charitably assign a grade of D-. When the overall findings of the survey, including safety data, are considered the grade must be reduced. An unconscionably large number of hazards were reported, including hard surfaces under equipment, exposed concrete footings, heavy metal and wood swing seats, sharp corners and projections, broken and missing parts, excessive climbing heights, entrapment areas, and shearing or crushing areas on rotating devices.

The logical conclusion arising from studies using cognitive and social play categories is that the developmentally oriented playground should include space, materials, equipment and activities to enhance, enrich, and encourage all the forms or processes of play appropriate to the age or developmental levels of the children involved. For instance the play environment for infants should emphasize age/size appropriate equipment for

motor development-climbing, swinging, sliding, crawling, etc.; loose parts for preliminary exploration, behaviors, feeling, stacking, throwing, etc.; and simple toys (dolls, animals, etc.) for preliminary dramatic play behaviors. Obviously the play space for infants would not need a level, grassy field for organized games as would the playground for school age children.

By the time most children enter elementary school (kindergarten or first grade at age five or six) all of the major forms of play, both cognitive (exercise, dramatic, constructive, organized games) and social (solitary, parallel, associative, cooperative) are engaged in by the children.

Consequently, the developmentally appropriate play environment should include materials, equipment, space and activities to enhance all forms of play. Elementary school playgrounds should be much larger than infancy/ toddler and preschool playgrounds to accommodate the wider range of play engaged in by the older children. The range of loose parts and large equipment would also be more extensive.

Preschool (ages 3-5) and primary school (ages 5-9 or K-3) playgrounds should contain equipment designed primarily for <u>exercise</u> play (climbing, swinging, crawling, balancing, rotating, sliding, etc.); loose parts for <u>dramatic</u> and <u>construction</u> play (blocks, sand, water, sand and water play equipment, work benches with vices, garden tools, carpentry and mechanical tools, assorted tires and boards, etc.); a convenient storage facility linked to a wheeled vehicle track, to house loose parts and wheeled vehicles; a large, flat grassy area for <u>organized games</u>, complemented with games materials (balls, bats, jump ropes, games, etc.) in the storage facility; semi-private areas to accommodate <u>solitary</u> and <u>parallel</u> play and to complement the organized games areas designed for <u>cooperative</u> <u>organized</u> play.

Because of the crowded conditions in urban areas and the large amount of time spent in school and watching television, schools now must assume responsibility for providing nature experiences for children that will enrich understandings and appreciation for the natural habitat and complement science teaching in the classroom. Nature areas should be provided in the play environment that allow children to observe, explore, experiment and play in an environment of plants, animals and natural terrain (hills, streams, rocks, etc.). Tools should be available for the children to use in caring for the total play environment-to help ensure sense of ownership and responsibility and to develop tool-using capabilities. Children should also have access to building and digging areas where they can learn to use tools (with supervision) in reconstructing the terrain, and in creating play houses and habitats for animals.

Modern superstructures provide within limited space, a broader array of exercise opportunities than did the traditional, single or limited function equipment, scattered randomly or in rows about a playing field. The physical design of superstructures make it easier to provide a resilient surface in fall zones. But more importantly superstructures enhance playability in five important ways: (1) the sand used for fall zones is also a medium for children's dramatic and construction play, (2) virtually unlimited complexity and perceptual-motor opportunities (gross motor, fine motor, body awareness, spatial awareness, directional awareness, balance activities, expressive activities, integration activities) can be integrated into the modular structures, (3) the provision of loose parts in rich variety can further enhance various forms of social, cognitive and motor play, (4) the structures themselves can be designed to create semi-private places (under decks) for children's play. (5) superstructures feature linkage between

activity options that lead children from activity to activity and these activity options (challenges) can be moved from place to place on the superstructure. Overall, the modern modular superstructures, when properly designed and complemented with sand, loose parts, materials for building and natural terrain for interacting with nature, represent a giant step forward in play structure development. The writer anticipates that a next major step by designers will be to increase flexibility by making structures free-standing rather than setting them in concrete.

The growing body of evidence (Frost, 1986) points to a play environment containing complex superstructures and simple loose parts to be used in combination. The apparent contradiction is resolved when one considers that large, complex structures cannot readily be modified by children so complexity must be built in. On the other hand, children can create with loose parts in almost unlimited fashion. Since children create characters through mental imagery the loose parts need not be theme specific - raw materials such as water, sand, lumber, tires, spools, etc. function very effectively.

Finally, everyone concerned with children's playgrounds must grow to understand that traditional American playgrounds are bad from both safety and developmental perspectives. Public school administrators and teachers receive little or no formal training about play and child development and hold play in low regard. School boards, seeing little support for play in the schools, leave playground development to parent-teacher organizations and channel public funds to academics and organized sports. It is hoped that the rapidly growing body of research evidence for the value of children's play will lead to changed attitudes and improved playgrounds.

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